Amendments of the Claims:

Claim 1 (Original): A method for determining the temperature of a radiating body utilizing the alexandrite effect, the method comprising the steps of:

receiving radiation from the radiating body;

measuring a spectral power distribution of the radiation;

filtering the spectral power distribution with an alexandrite effect filter;

calculating a hue value based on the spectral power distribution; and

calculating the temperature based on a predetermined mathematical relationship between the hue value and temperature of the alexandrite effect filter.

Claim 2 (Original): The method according to Claim 1 wherein the alexandrite effect refers to a color change of a material under a blackbody radiator at different temperatures.

Claim 3 (Original): The method according to Claim 1 wherein the alexandrite effect further refers to a color change of a material under different types of light sources at different color temperature.

Claim 4 (Original): The method according to Claim 1 wherein the alexandrite effect filter comprises any material that shows the alexandrite effect.

Claim 5 (Original): The method according to Claim 1 wherein the predetermined mathematical relationship is generated by the steps of:

measuring a spectral transmittance of the alexandrite effect filter along the direction perpendicular to its surface;

calculating hue values for the alexandrite effect filter under a blackbody at different temperatures in a selected color space; and

determining the mathematical relationship between the hue values and corresponding temperatures in the color space in which the hue values are calculated.

Claim 6 (Original): The method according to Claim 5 wherein the mathematical relationship between the hue value and temperature of the alexandrite effect crystal can be generated in any color space.

Claim 7 (Original): The method according to Claim 6 wherein the color space is selected from the group consisting of CIELAB, CIELUV, and CIE(x, y), the CIELAB color space being typically selected due to its uniformity for color perception.

Claim 8 (Original): The method according to Claim 1 wherein the mathematical relationship between the hue angle and temperature is generated utilizing the following equations in the CIELAB color space:

$$X = \int \bar{x}(\lambda)s(\lambda)P(\lambda)d\lambda$$
$$Y = \int \bar{y}(\lambda)s(\lambda)P(\lambda)d\lambda$$
$$Z = \int \bar{z}(\lambda)s(\lambda)P(\lambda)d\lambda$$

where X, Y, and Z are CIE tristimulus values of the alexandrite effect crystal, $\bar{x}(\lambda)$, $\bar{y}(\lambda)$, and $\bar{z}(\lambda)$ are CIE color-matching functions, $s(\lambda)$ is the spectral power distribution of the radiating body measured, and P(λ) is a spectral transmittance of the alexandrite effect filter used;

$$L^* = 116(Y/Y_n)^{1/3} - 16$$
$$a^* = 500\left[(X/X_n)^{1/3} - (Y/Y_n)^{1/3}\right]$$
$$b^* = 200\left[(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}\right]$$

where L*, a* and b* are coordinates of CIELAB color space, and X_n, Y_n, and Z_n are the tristimulus values of the measured radiating body;

$$h_{ab} = \arctan(b^*/a^*)$$

where h is the hue angle;

$$T = f(h)$$

where T is the temperature, the temperature being a function of the hue angle h selected from the group consisting of a polynomial function, an exponential function, a logarithmic function, a trigonometric function, and mixtures thereof, wherein the following polynomial equation is typically selected:

$$T = a_0 + a_1 h + a_2 h^2 + \ldots + a_n h^n$$

where a is a parameter in a polynomial function to the n^{th} power of the hue-angle, wherein large values of n correspond to more accuracy of the polynomial function, n being equal to 3 for small temperature ranges, and n being equal to 6 for large temperature ranges.

Claim 9 (Original): The method according to Claim 8 wherein parameters of the polynomial equation are obtained by regression calculations using data of the hue value versus temperature.

Claim 10 (Original): The method according to Claim 8 wherein only a long wavelength component of the $\bar{x}(\lambda)$ function is used to calculate the hue value, the used $\bar{x}(\lambda)$ function having actual values from 510 nm to 760 nm and being zero from 380 nm to 510 nm.

Claim 11 (Original): The method according to Claim 1 wherein the spectral power distribution has a wavelength range from ultraviolet radiation (100 nm) to infrared radiation (5,000 nm).

Claims 12 – 28 (Canceled)